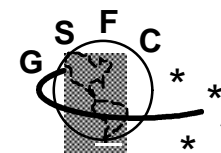# NCC 98 LIAISON PRESENTATION
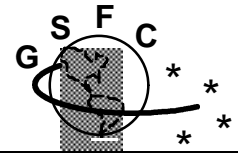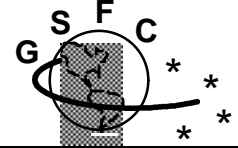
December 1998

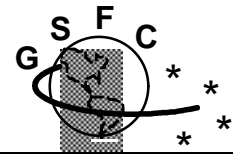Network and Mission Services Project

GSFC Code 451.5

AGENDA

- Purpose
- NCC 98 Overview
- Contents
- Status
- Engineering Interface Testing
- Transition Status and Activities
- Related Program Status
- Issues

PURPOSE

- Identify and address customer/element issues and concerns

- Continue the dialog between the NCC and SN customers and elements

- Present the current status of NCC/SN-related projects at GSFC

- Initiate test planning with SN customers and elements

- Establish testing/transition points of contact

POINTS OF CONTACT

- NCC 98 Operations Test Release Leader

  Melanie Wiedmann, melanie.wiedmann@gsfc.nasa.gov, (301)805-3264

- NCC 98 Project Management Support

  Shelley Harper, harper_shelley@bah.com, (301)805-5450

- NCC Test Manager

 Lynn Myers, lynn.myers@gsfc.nasa.gov, (301)286-6343
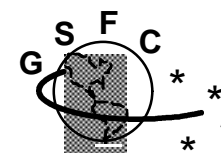
NCC 98 Contents

- ## NCC 98 is a major release and upgrade of the NCC Data System (NCCDS)

  - Supports New TDRS H,I,J Capabilities

  - World Wide Web TDRS Unscheduled Time (TUT)

  - Flexible SN Service Scheduling

  - Supports TCP/IP and UDP/IP encapsulated 4800 BB Interfaces

  - Supports Network Connectivity/Security (AIS/SL3)

  - Y2K Compliant
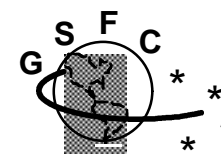
- # TDRS H, I, J Capabilities:

  - ## Increased Number of Services

    - ### Ka-band SA

  - ## Enhanced SMA Services

  - ## Ability to Support Higher Data Rates

  - ## Legacy Services Support
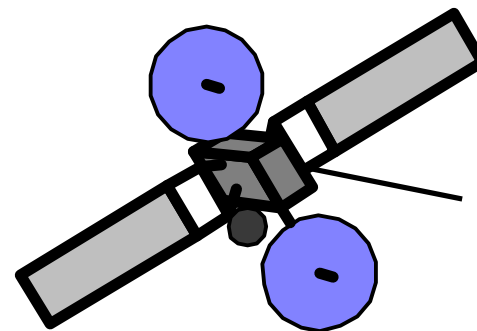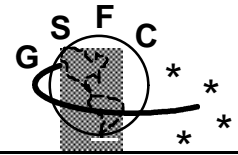
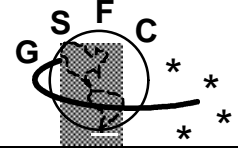- # World Wide Web TDRS Unscheduled Time (TUT):
  - Used to inform customers of time periods during which TDRSS services are available (replacing the e-mail TUT service)
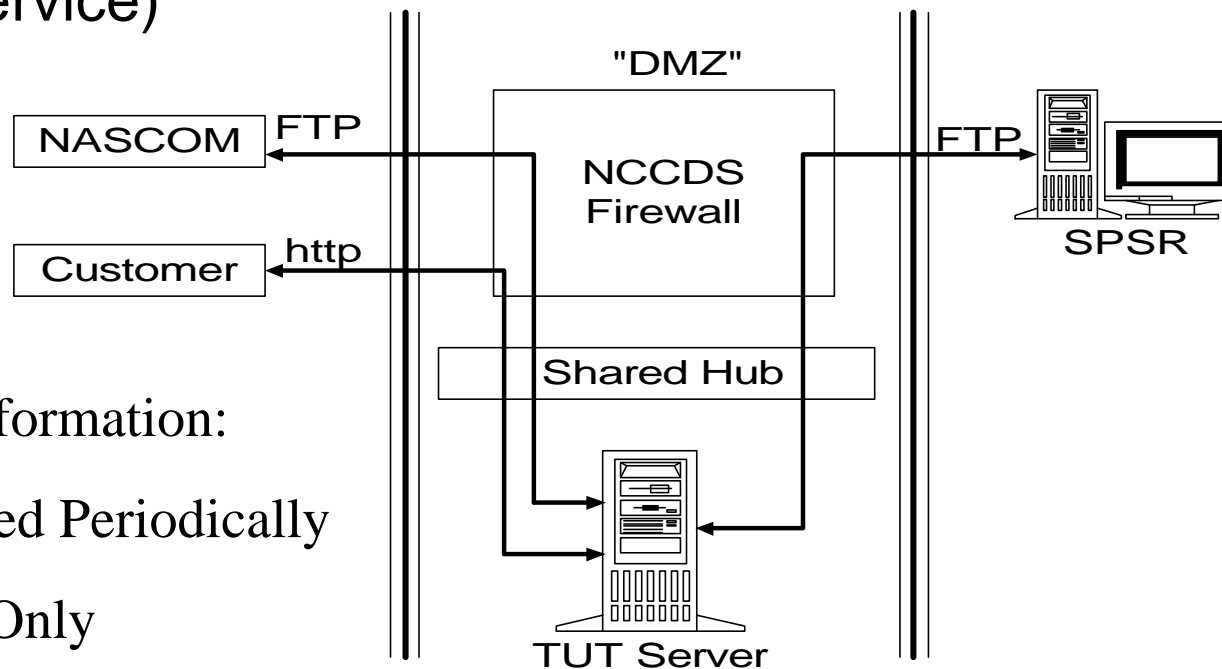
TUT Information:

- Updated Periodically

- Read Only

- Connectivity = Closed IONET

- **Flexible SN Service Scheduling:**
  - Baseline customers retain current capabilities
    - Event start time tolerance and SA antenna flexibility
  - New flexible scheduling features offer the potential to reduce the amount of operator-to-operator coordination required throughout the scheduling period
    - TDRS Scheduling Windows
    - Event start/stop time tolerances
    - Event and/or service duration flexibility
    - Resource Flexibility on both SA antenna and TDRS
    - Alternate Requests when primary cannot be scheduled

- – Flexible Scheduling Features (cont):
  - Replace Requests to request replacement of an existing event and/or request
  - Wait List Requests to request that a declined request be put on the wait list
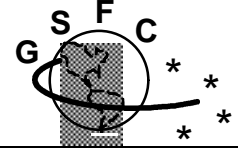
- ## NCC Customer Classifications:
  - Baseline Customers
    - Functionality is unchanged
      - Changes to NCC are <u>transparent</u> to customer
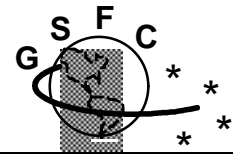   - Continuous support
    - TUT, FTP, and TDRS H,I,J capabilities
    - TCP/IP or UDP/IP-encapsulated 4800 BB support
  - Enhanced Customers
    - Adhere to new message formats
    - No flexible scheduling
  - Full Support Customers
    - Capability to utilize full NCC 98 enhancements
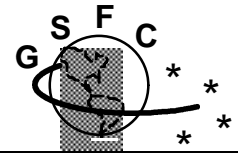
STATUS

- ## Development and Testing Status:
  - Development Status
    - Development complete with software fixes in work
    - COTS upgrades ongoing for Year 2000
  - Testing Status
    - System testing of the final development release is complete
    - All Y2K systems testing successfully completed with rollover conditions simulated
    - Operational Evaluation Test Phase concurrent with system test and scheduled for completion in Jan.

ENGINEERING INTERFACE TESTING

- Objectives of EIF:
  - Test backwards compatibility and verify new message formats
  - Exercise operational scheduling and real-time scenarios with customers and elements
  - Test TUT, FTP, and TDRS H,I,J enhanced services with customers choosing to implement them
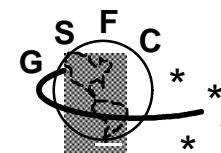
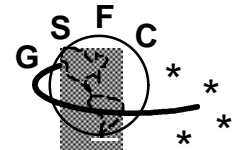# EIF Test Participants

Customers:

- CGRO
- ERBS
- HST
- JSC
- LSAT/ LSAT 7
- MSOC/ UPS
- Starlink
- UARS

- EOC
- EUVE
- JPL/TOPEX
- LDBP
- MSFC
- RXTE
- TRMM
- UPS Japan

Elements:

- FDF/ BRTS
- NASCOM
- SDPF
- WSC

Development:

- UPS 98

Customer Scheduling & Real-Time Testing:

Baseline Customers:

- Scheduling
  - Schedule Add Requests
  - Schedule Delete Request
  - User Schedule Messages
- Real-Time
  - Ground Control Message Requests
  - User Performance Data
- Valid and invalid messages will be utilized

Full-Support Customers:

- Scheduling
  - All baseline messages
  - Schedule Replace Request
  - Schedule Result Request
  - Alternate Schedule Add Request
  - Flexible SAR
  - Wait List Request
  - TDRSS Schedule Windows
- Real-Time
  - All baseline messages

•IIRV Transmission as applicable

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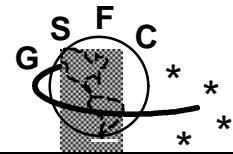
- # SN Element Testing:
  - ## Regression Testing
    - Ensures no breach of current functionality with the introduction of NCC 98
  - ## FDF (BRTS)
    - Test new Service Specification Codes
  - ## WSC
    - Verify support of new TDRS H,I,J expanded services
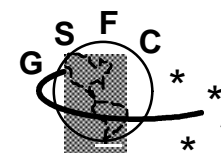
Test Planning and Execution

Test Coordination:
- Establish contact
- Test date planning

Draft Briefing Message:*
- participating entities
- points of contact
- test objectives
- S/D codes

Draft Test Script:*
- procedures
- timelines

• 3 days prior

| Element/ Customer Coordination | → | Test Readiness Review | → | Briefing Message Sent | → | Test Execution | → | Test Results |

- Finalize briefing message
- Finalize test script
- Coordinate S/D codes, IP
  addresses

Identify & Resolve Anomalies

***Iterative Process**

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- # Year 2000 Verification:
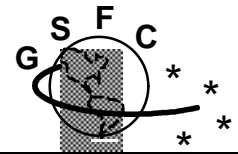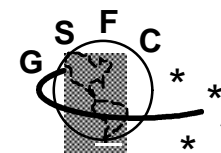 - Environment configured for 2-day test commencing on a simulated time of Dec. 31, 1999. NCC will support customers wishing to verify year 2000 compliance.
  - Other rollover timeframes to be considered for test
    - Feb. 28 to Feb. 29, 2000
    - Feb.29 to March 1, 2000
    - Dec. 30 to Dec. 31, 2000
    - Dec. 31, 2000 to Jan. 1, 2001

- ## Year 2000 Test Activities:

  - Forecast requests for 1999 and 2000

  - Schedule generation and activation

  - Receipt and transmission of vectors with epoch times in both 1999 and 2000

  - Active Events

    - Starting and ending in 1999

    - Starting in 1999 and ending in 2000

    - Starting and ending in 2000

    - ODMs/UPDs

    - GCMRs

 - Incoming requests during rollover

Sample EIF Test Schedule

Activity Name	Jun 1	8	15	22	29	Jul 6	13	20	27	Aug 3	10	17	24	31	Sep 7	14	21	28	Oct 5	12	19	26	Nov 2	9	16	23	30
BRTS										△	▽																
Compton GRO											△	▽															
EOS AM-1												△	▽														
ERBS													△	▽													
EUVE														△	▽												
FDF															△	▽											
HST																△	▽										
JPL/Topex/Poseidon																	△	▽									
JSC/ISS/Space Shuttle																		△	▽								
Landsat 7																			△	▽							
LDBP																				△	▽						
MSFC - Spacelab																					△	▽					
Nascom																					△	▽					
NASDA UPS-J																					△	▽					
SDPF																					△	▽					
SP&M																					△	▽					
STARLink																					△	▽					
TRMM																					△	▽					
UARS																					△	▽					
WSC/SMTF																					△	▽					
RXTE																					△	▽					
Year 2K Testing																					△	▽					

Legend:
△ Scheduled Test Date
▽ Backup Test Date
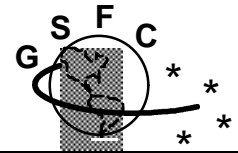
- ## Test Documentation:
  - Engineering Interface Test Coordination Plan, 451-EIFTCP-NCC98
  - Briefing messages
  - Test scripts
  - Interface Incident Reports (IIR)
  - Post-test debriefing reports
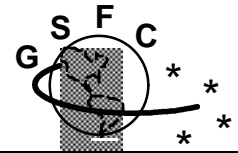
TRANSITION STATUS

- Transition to NCC 98:
  - Original plan was to deliver the entire release to operations in September of 1998
  - Development and Y2K issues resulted in two releases
    - Initial Release: To be delivered in February of 1999
      - Y2K implementation
    - Completion Release - To be delivered in May of 1999
      - Flexible Scheduling Capabilities
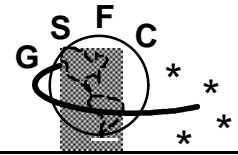
TRANSITION ACTIVITIES

- ## NCC 98 Transition to Operations:
  - Criteria For Transition
    - Successful completion of OET testing
    - Successful completion of test programs, e.g. EIF
  - Operations Transition
    - NCC 98 installation in operations environment
    - Systems checkout
    - Database freeze
    - Transition
      - All database changes must be redone by NCC operators after cutover to operations with NCC 98
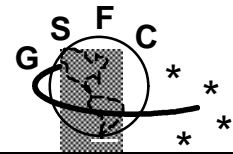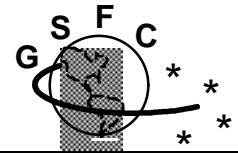
RELATED PROGRAMS STATUS

- ## UPS 98 Development
  - – UPS Release 12 supports all NCC 98 flexible scheduling capabilities

- ## TDRS H,I,J
  - – Launch of first spacecraft scheduled for July, 1999
  - – Launch of additional spacecraft spaced over 3 year period

- ## Nascom IP Transition
  - – Customer conversion device installation completed
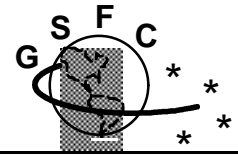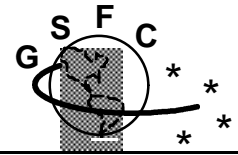 - – MDM replacement in progress

ISSUES

- Are there any customer activities which may impact NCC 98?

- What is the status of the customer's transition to IP?

- TCP/IP customers - do you have "keep alive" capability to ensure that dropped connections do not go unnoticed?

BACKUPS:

<u>Documentation</u>

- NCC 98 Operations Concept, 530-OCD-NCC98

- Interface Control Document Between the Network Control Center and the Mission Operations Centers, 530-ICD-NCCDS/MOC

- Interface Control Document Between the Network Control Center and the Flight Dynamics Facility, 530-ICD-NCCDS/FDF

- Interface Control Document Between the Network Control Center and the Sensor Data Processing Facility, 530-ICD-NCCDS/SDPF
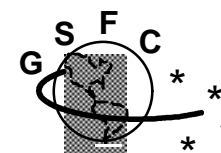
Documentation Cont'd

- Interface Control Document Between the Network Control Center/Flight Dynamics Facility and the White Sands Complex, 530-ICD-NCC/FDF-WSC

- Test and Transition Master Plan, 451-TTMP-NCC98

- Documentation available at http://ncc98.gsfc.nasa.gov
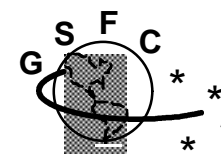
<u>Acronym List</u>

AIS/SL Automated Information System/Security Level

BB   Bit Block

BRTS   Bilateration Ranging Transponder System

CGRO   Compton Gamma Ray Observatory

COTS   Commercial Off The Shelf

DB   DataBase

DSID   Data Stream Identification

EIF   Engineering Interface

EOC   EOS Operations Center

EOS   Earth Observing System

ERBS   Earth Radiation Budget Satellite

EUVE   Extreme UltraViolet Explorer

FDF   Flight Dynamics Facility
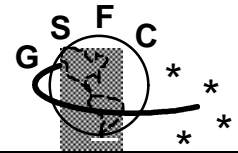
FTP   File Transfer Protocol

GCMR Ground Control Message Request

HST   Hubble Space Telescope

IIR   Interface Incident Report

IIRV   Intermediate InterRange Vector

IONET IP Operational Network

IP   Internet Protocol

ISS   International Space Station

JPL   Jet Propulsion Laboratory/

JSC   Johnson Space Center

LDBP   Long Duration Balloon Project

LSAT   Landsat

MDM   Multiplexer DeMultiplexer

MSOCC Multi-Satellite Operations Control Center
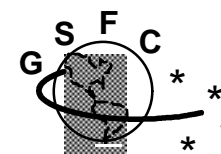
NCC   Network Control Center

NISN   Nascom Integrated Services Network

ODM   Operations Data Message

OET   Operations Evaluation Test

ORR   Operations Readiness Review

RXTE   Rossi X-ray Timing Explorer

S/D   Source/Destination

SA   Single Access

SAR   Schedule Add Request

SDPF   Sensor Data Processing Facility

SMA   S-band Multiple Access

SN   Space Network

STARLink Satellite Telemetry And Return Link

TCP/IP Transmission Control Protocol/Internet Protocol

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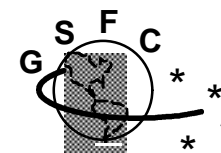
TDRS   Tracking and Data Relay Satellite

TOPEX Topography Experiment

TRMM   Tropical Rainfall Measuring Mission

TUT   TDRS Unscheduled Time

UARS   Upper Atmosphere Research Satellite

UDP/IP User Datagram Protocol/Internet Protocol

UPD   User Performance Data

UPS   User Planning System

WSC   White Sands Complex